

This Listing of Claims will replace all prior versions, and listings, of claims in this application:

Listing of the Claims

1. (Currently Amended) A user request processing method, using an upstream channel, after a three-dimensional scene generated based on a binary format, is transmitted from a server to a terminal, the user request processing method comprising the steps of:

(a) setting downstream/upstream channels between the server and the terminal as initialization;

(b) the terminal forming an upstream channel message if a user request of predetermined processing of a predetermined object ~~is occurred~~ occurs in a scene transmitted from the server to the terminal through the downstream channel, and transmitting the message to the server through the upstream channel;

(c) the server receiving the upstream channel message, interpreting the message, processing the message as the user request of predetermined processing, and transmitting the result to the terminal; and

(d) the terminal substituting the processing result of step (c) for the predetermined object in the scene transmitted in step (b), and providing it to the user.

2. (Original) The user request processing method of claim 1, wherein step (b) further comprises the steps of:

(b1) defining the corresponding node in the scene, in which the user request occurred, using information on objects forming the transmitted scene;

(b2) determining the node identifier of the defined node, using information on the objects;

(b3) defining a command to be executed in the server for the defined node, in response to the user request; and

(b4) forming an upstream channel message containing the node identifier and the command.

3. (Original) The user request processing method of claim 2, wherein the information on the objects contains node identifiers based on sequence information or locations of nodes corresponding to the objects in the scene generated based on a binary format.

4. (Original) The user request processing method of claim 2, wherein step (b2) further comprises the steps of:

(b2-1) determining whether or not the defined node is reusable in the scene, by the presence of a node identifier;

(b2-2) if a node identifier assigned for reuse is in the defined node, using the node identifier; and

(b2-3) if a node identifier assigned for reuse is not in the defined node, using a node identifier which has a node identifier and is immediately above the defined node.

5. (Original) The user request processing method of claim 4, wherein in step (b2-3), if the defined node and all other nodes in the scene are not reusable, the node identifier of the defined node is determined as a value which is for all nodes as subjects.

6. (Original) The user request processing method of claim 2, wherein step (c) further comprises the steps of:

(c1) receiving the upstream channel message, interpreting the node identifier in the upstream channel message, and defining a subject node to be processed; and

(c2) if a subject node to be processed is defined, confirming a node command in the upstream channel message, and processing the subject node according to the node command.

7. (Original) The user request processing method of claim 6, wherein in step (c1), the subject node is defined after confirming at least whether or not the node identifier is for a node contained in the scene, and the structure type of the node indicated by the node identifier.

8. (Original) The user request processing method of claim 7, wherein in step (c1), a subject node is defined after confirming information on nodes directly dependent on the node indicated by the node identifier.

9. (Original) The user request processing method of claim 7, wherein in step (c1), if the node identifier is a value for all the nodes in the scene as subjects, all the nodes in the scene are defined as subject nodes.

10. (Previously Presented) The user request processing method of claim 1, wherein the scene is generated based on a moving picture expert group (MPEG)-4 binary format in an MPEG-4 system, the server has an MPEG-4 scene encoder, and the terminal has an MPEG-4 scene decoder.

11. (Original) A user request processing apparatus using an upstream channel in a system providing bidirectional communication services, the user request processing apparatus comprising:

a server for transmitting through a downstream channel a three-dimensional scene generated based on a binary format, receiving and interpreting an upstream channel message, and processing the message as user's request of predetermined processing; and

a terminal for forming an upstream channel message if a user request of predetermined processing for a predetermined object in the scene transmitted from the server occurs, and transmitting the message to the server through an upstream channel.

12. (Original) The user request processing apparatus of claim 11, wherein the terminal comprises:

a node interpreter for defining a corresponding node in the scene, for which the user request occurred, using information on the objects forming the transmitted scene;

a node identifier determiner for determining a node identifier of the defined node, using information on the objects;

a command generator for defining a command to be processed in the server, in response to the user request for the defined node; and

an upstream channel message transmitter forming an upstream channel message containing the node identifier and the command.

13. (Original) The user request processing apparatus of claim 12, wherein information on the objects includes node identifiers according to sequence information or locations of nodes corresponding to objects in the scene generated based on the binary format.

14. (Original) The user request processing apparatus of claim 12, wherein the node identifier determiner further comprises:

a node identifier presence determiner for determining whether or not the defined node is reusable in the scene, by the presence of a node identifier, and if a node identifier assigned for reuse exists in the defined node, using the corresponding node identifier; and

a node identifier generator for using the node identifier of a node, which is immediately above the defined node and has a node identifier, if a node identifier assigned for reuse does not exist in the defined node.

15. (Original) The user request processing apparatus of claim 14, wherein the node identifier generator sets the node identifier of the defined node to a value for all nodes as subjects, if the defined node and all other nodes in the scene are not reusable.

16. (Original) The user request processing apparatus of claim 12, wherein the server comprises:

an upstream channel message receiver for receiving the upstream channel message;

a node interpreter for interpreting the node identifier in the upstream channel message and defining subject nodes to be processed; and

a command processor for confirming node commands in the upstream channel message, if the subject nodes are defined, and processing the subject nodes according to the node commands.

17. (Original) The user request processing apparatus of claim 16, wherein the node interpreter defines a subject node after confirming at least whether or not the node identifier is for a node contained in the scene, and the structure type of the node indicated by the node identifier.

18. (Original) The user request processing apparatus of claim 17, wherein the node interpreter defines a subject node after confirming information on nodes directly dependent on the node indicated by the node identifier.

19. (Original) The user request processing apparatus of claim 17, wherein the node interpreter defines all the nodes in the scene as subject nodes if the node identifier is a value for all the nodes in the scene as subjects.

20. (Previously Presented) The user request processing apparatus of claim 11, wherein the scene is generated based on a moving picture expert group (MPEG)-4 binary format in an MPEG-4 system, the server has an MPEG-4 scene encoder, and the terminal has an MPEG-4 scene decoder.

21. (Currently Amended) A user request processing method using an upstream channel in interactive multimedia contents services, the user request processing method comprising the steps of:

(a) setting downstream/upstream channels between the server and the terminal as initialization;

(b) the terminal forming an upstream channel message if a user request of predetermined processing of a predetermined element ~~is occurred~~ occurs in a multimedia content transmitted from the server to the terminal through the downstream channel, and transmitting the message to the server through the upstream channel;

(c) the server receiving the upstream channel message, interpreting the message, processing the message as the user request of predetermined processing, and transmitting the result to the terminal; and

(d) the terminal substituting the processing result of step (c) for the predetermined element in the multimedia content transmitted in step (b), and providing it to the user.

22. (Original) The user request processing method of claim 21, wherein the upstream channel message in step (b) is formed to have at least an inherent identifier, which can be confirmed in a server assigned for the predetermined element, and a command corresponding to the user request of predetermined processing.

23. (Original) A user request processing apparatus using an upstream channel in a system providing bidirectional communication services, the user request processing apparatus comprising:

a server for transmitting multimedia contents through a downstream channel, receiving and interpreting an upstream channel message, and processing the message as user's request of predetermined processing; and

a terminal for forming an upstream channel message if a user request of predetermined processing for a predetermined element in the multimedia contents transmitted from the server occurs, and transmitting the message to the server through an upstream channel.

24. (Original) The user request processing apparatus of claim 23, wherein the upstream channel message in step (b) is formed to have at least an inherent identifier, which can be confirmed in a server assigned for the predetermined element, and a command corresponding to the user request of predetermined processing.